TABLES OF SUN-SPOT FREQUENCIES, 1901-1914.

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The reader will find the first complete and revised series of both the observed and the smoothed Wolf-Wolfer relative sun-spot numbers in the MONTHLY WEATHER REVIEW, April, 1902, in Tables 1 and 2, on pages 173 and 176. On page 171 of that issue the significance of these numbers is explained by Prof. Wolfer as follows:

The *smoothed relative numbers* of Table 2 present the mean course of the spot phenomena; that is to say, without the numerous secondary short-period variations that really occur in addition to the 11-year variation. Investigations into the general course of the phenomena and into other periods should therefore be based upon these "*smoothed numbers*" and not on the "observed numbers." The method of formation of these numbers has been explained by Wolf in No. 42 of his Astronomische Mitteilungen.

It is also explained in the issue of the REVIEW mentioned, and the significance of his "relative numbers" is given in the REVIEW for November, 1901, page 505.

Prof. Wolfer has just published in the Meteorologische Zeitschrift for May, 1915, pages 193–195, the latest values for both the "observed" and the "smoothed" relative numbers, and has added to these Table 3, showing the epochs of sun-spot maxima and minima with the intervening periods. These three tables are here reprinted as in continuation of the tables published in the REVIEW of April, 1902.[1]—[C. A. jr.]

TABLE 1.—*Observed relative sun-spot numbers, Wolf-Wolfer system, 1901–1914.*

Year.	Jan. I.	Feb. II.	Mar. III.	Apr. IV.	May V.	June VI.	July VII.	Aug. VIII.	Sept. IX.	Oct. X.	Nov. XI.	Dec. XII.	Average.
1901...	0.2	2.4	4.5	0.0	10.2	5.8	0.7	1.0	0.6	3.7	3.8	0.0	2.7
1902...	5.2	0.0	12.4	0.0	2.8	1.4	0.9	2.3	7.6	16.3	10.3	1.1	5.0
1903...	8.3	17.0	13.5	26.1	14.6	16.3	27.9	28.8	11.1	38.9	44.5	45.6	24.4
1904...	31.6	24.5	37.2	43.0	39.5	41.9	50.6	58.2	30.1	54.2	38.0	54.6	42.0
1905...	54.8	85.8	56.5	39.3	48.0	49.0	73.0	58.8	55.0	78.7	107.2	55.5	63.5
1906...	45.5	31.3	64.5	55.3	57.7	63.2	103.3	47.7	56.1	17.8	38.9	64.7	53.8
1907...	76.4	108.2	60.7	52.6	43.0	40.4	49.7	54.3	85.0	65.4	61.5	47.3	62.0
1908...	39.2	33.9	28.7	57.6	40.8	48.1	39.5	90.5	86.9	32.3	45.5	39.5	48.5
1909...	56.7	46.6	66.3	32.3	36.0	22.6	35.8	23.1	38.8	58.4	55.8	54.2	43.9
1910...	26.4	31.5	21.4	8.4	22.2	12.3	14.1	11.5	26.2	38.3	4.9	5.8	18.6
1911...	3.4	9.0	7.8	16.5	9.0	2.2	3.5	4.0	4.0	2.6	4.2	2.2	5.7
1912...	0.3	0.0	4.9	4.5	4.4	4.1	3.0	0.3	9.5	4.6	1.1	6.4	3.6
1913...	2.3	2.9	0.5	0.9	0.0	0.0	1.7	0.2	1.2	3.1	0.7	3.8	1.4
1914...	2.5	2.6	3.1	17.3	5.3	11.4	5.4	7.8	12.8	8.1	16.1	22.2	9.6

TABLE 2.—*Smoothed relative sun-spot numbers, Wolf-Wolfer system, 1901–1914.*

Year.	Jan. I.	Feb. II.	Mar. III.	Apr. IV.	May V.	June VI.	July VII.	Aug. VIII.	Sept. IX.	Oct. X.	Nov. XI.	Dec. XII.	Average.
1901...	4.8	4.4	3.9	3.2	2.8	2.8	3.0	3.1	3.3	3.6	3.3	2.8	3.4
1902...	2.6	2.7	3.1	3.9	4.7	5.0	5.2	6.0	6.8	7.9	9.5	10.6	5.7
1903...	12.3	14.6	15.8	16.9	19.3	22.5	25.4	26.6	27.9	29.6	31.4	33.5	23.0
1904...	35.5	37.7	39.7	41.1	41.5	41.6	42.9	46.4	49.8	50.5	50.7	51.3	44.1
1905...	52.5	53.5	54.6	56.6	60.5	63.4	63.1	60.4	58.5	59.5	60.6	61.6	58.7
1906...	63.4	64.2	63.8	61.3	55.9	53.5	55.1	59.6	62.7	62.4	61.7	60.1	60.3
1907...	56.9	55.0	56.4	59.6	62.6	62.8	60.5	55.9	51.4	50.3	50.4	50.6	56.0
1908...	50.5	51.6	53.2	51.9	49.9	48.9	49.3	50.5	52.6	53.1	51.9	50.6	51.2
1909...	49.4	46.4	41.6	40.7	42.2	43.3	42.6	40.7	38.2	35.4	33.8	32.8	40.6
1910...	31.5	30.1	29.1	27.7	24.7	20.6	17.6	15.7	14.2	14.0	13.8	12.8	21.0
1911...	12.0	11.2	10.0	7.6	6.0	5.9	5.6	5.1	4.6	4.0	3.3	3.2	6.5
1912...	3.2	3.0	3.1	3.4	3.4	3.4	3.7	3.9	3.8	3.5	3.2	2.8	3.4
1913...	2.6	2.5	2.2	1.8	1.7	1.5	1.4	1.4	1.5	2.3	3.2	3.9	2.2
1914...	4.6	5.0	5.8	6.5	7.4	8.8	......	......	......	......	......	......	......

[1] The present tables extend the records published in Bull., Mount Weather Observatory, 5, pt. 6, 1913, p. 368.

TABLE 3.—*Epochs of sunspot maxima and minima.*

Minima.			Maxima.		
Epochs.	Weight.	Periods.	Epochs.	Weight.	Periods.
		α			α
1610.8	5	....	1615.5	2	....
1619.0	1	8.2	1626.0	5	10.5
1634.0	2	15.0	1639.5	2	13.5
1645.0	5	11.0	1649.0	1	9.5
1655.0	1	10.0	1660.0	1	11.0
1666.0	2	11.0	1675.0	2	15.0
1679.5	2	13.5	1685.0	2	10.0
1689.5	2	10.0	1693.0	1	8.0
16.8 0	1	8.5	1705.5	4	12.5
1712.0	3	14.0	1718.2	6	12.7
1723.5	2	11.5	1727.5	4	9.3
1734.0	2	10.5	1738.7	2	11.2
1745.0	2	11.0	1750.3	7	11.6
1755.2	9	10.2	1761.5	7	11.2
1766.5	5	11.3	1769.7	8	8.2
1775.5	7	9.0	1778.4	5	8.7
1784.7	4	9.2	1788.1	4	9.7
1798.3	9	13.6	1805.2	5	17.1
1810.6	8	12.3	1816.4	8	11.2
1823.3	10	12.7	1829.9	10	13.5
1833.9	10	10.6	1837.2	10	7.3
1843.5	10	9.6	1848.1	10	10.9
1856.0	10	12.5	1860.1	10	12.0
1867.2	10	11.2	1870.6	10	10 5
1878.9	10	11.7	1883.9	10	13.3
1889.6	10	10.7	1894.1	10	10.2
1901.7	10	12.1	1906.4	10	12.3
1913.4	10	11.7			

MISTPOEFFER, UMINARI, ATMOSPHERIC NOISES.

The noises long known in Holland as mistpoeffer were much talked of in Europe some 20 years ago, and articles relative to them will be found in the MONTHLY WEATHER REVIEW,[1] including several suggestions as to their possible origin. The noises seemed to come up out of or from the ocean and the waves, fog, or mist; their local names therefore indicated these local theories as to their origin. Similar sounds on Lake Seneca, N. Y., were known as the "Seneca guns;" the fishermen on the Banks of New Foundland knew them as "Seefahrts" "[Sea farts?]"; the similar sounds emanating from the drum fish as kept in our aquaria remind one of the mythical monster known to the Norsemen as Kraken, whose breathings caused the ocean tides. At Cape Haitien there appears to be a mysterious "gouffre" similar to rolling thunder and the Italians sometimes call similar noises "mugito."

Of all the natural methods of producing such sounds, such as distant cannonade or thunder near the coasts, or fog-horn calls reflected from the atmosphere or rocky bluffs, the most likely explanation is the reflection and transmission through the ocean of the booming of heavy surf against a rocky coast. This has now been first proposed by Dr. Terada in the journal of the Meteorological Society of Japan for July, 1915. He made a study of these noises on the southeast coast of Japan, by the use of Helmholtzian resonators, and we can not doubt that he has hit upon the correct explanation for the "mistpoeffer" of Holland and the "uminari" of Japan. The tremendous surf and breakers at Dover, on the rocky shores of Nova Scotia, the destructive "rollers" of St.

[1] Davison, quoted on "barisal guns." Monthly Weather Review, October, 1895, 23; 375.
S. W. Kain, etc., "Seismic and oceanic noises." Ibid., April, 1898, 26; 152-154.
Cancani, quoted on "marina" of Umbria. Ibid., May, 1898, 26: 216.
W. A. Prosser, on the "lake guns" of Lake Seneca, N. Y. Ibid., July, 1903, 31; 336.
C. F. Talman's note on "gouffre," "brontidi," "Nebelknall," etc. Ibid., December, 1907, 35: 575.